

upper section is the sleeve and dropping the upper section comprises dropping the sleeve.

95 ⁷
~~20~~. The plunger lift of claim 1 wherein the ball nests in the sleeve when the ball and sleeve are joined together in the well.

Remarks

The Official Office Action of August 30, 2001, and the references therein made of record have been carefully considered. The title has been amended. The specification has been amended on page 10, line 22 by deleting the term "which,".

The Examiner has rejected claims 1 and 4-6 as fully met by Cornette under 35 USC 102(b). Applicant controverts this rejection for the following reasons. Claim 1 recites:

A plunger lift for a well producing through a production string communicating with a hydrocarbon formation, comprising a free piston having

Applicant reads Cornette to provide a gravel pack assembly run on the bottom of a work string 54 above a cup packer 52. Applicant accordingly fails to see that Cornette has a free piston. Applicant has always understood a free piston to mean something that is free to move up and down in a well. Cornette's gravel pack

assembly is run on the bottom of a work string. It is apparent the U.S. Patent and Trademark Office also recognizes what the term free piston means because class 417/56, where an apparatus of this type is likely classified, is entitled "Drilled Well Free Piston Type Pump." Thus, the term "free piston" is well recognized in the art.

In the event the Examiner continues a rejection of claim 1, 4 or 6 on Cornette, it is respectfully requested that the Examiner point out, with particularity, how Cornette's gravel pack assembly is a free piston or where the free piston is in Cornette's device. From applicant's perspective, the ball 34 is the only thing that looks like a free piston and it clearly does not comprise a sleeve and a ball.

If claim 1 cannot be rejected on Cornette, it follows that the rejection of claims 2 and 3 is inappropriate because the secondary reference to Despax and Jennings do not remedy the defects of Cornette.

Claim 7 has been amended to incorporate claim 9. Accordingly, claim 7 and its dependent claims 8 and 10 are allowable.

Claim 11 has been amended in two ways. The housekeeping amendment is to make "section" plural in the last paragraph. The more substantive amendment is to delete the phrase "at a time when . . . the bumper assembly." This has been deleted because the same recitation appears in claim 15 and the recitations are redundant.

Claims 16-20 have been added to obtain claims commensurate with the scope of the invention.

A marked up copy of the paragraph bridging pages 10 and 11 and a marked up copy of claims 7 and 11 are attached. A set of formal drawings are attached.

It is accordingly submitted that this application is in condition for allowance and early steps toward that end are earnestly solicited.

Respectfully submitted,



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The piston 26 is of unusual design and is made in two pieces [which,] comprising an upper sleeve 38 and a ball 40. The sleeve 38 comprises a tubular body 42 having a central passage 44, a fishing lip 46 at the upper end thereof and an annular seating surface 48 at the lower end thereof sized to closely receive the ball 40. In other words, the seating surface 48 is generally hemispherical and has a radius of curvature matching that of the ball 40. The seating surface 48 is preferably recessed or nested into the sleeve 38 so that a portion of the ball 40 projects beyond the end of the sleeve 38. The main reason is that when the sleeve 38 contacts the ball 40 at the bottom of the well, the ball 40 prevents the sleeve 38 from contacting the bumper spring and either damaging the sleeve 38 or the bumper spring. Preferably, about 20-25% of the ball diameter projects below the sleeve 38.

7. (Amended) A plunger lift for a well producing through a production string communicating with a hydrocarbon formation, comprising a free piston having a lower section and at least one upper section, movable independently downwardly in the well, the sections being united at the bottom of the well and having an exterior seal for upward movement together in the well for pushing liquid, above the piston, upwardly, the upper section being made of a titanium alloy having a tensile strength of at least 90,000 psi

and the lower section [is] comprises a ball made of a material selected from the group consisting essentially of silicon nitride and titanium alloys having a tensile strength of at least 90,000 psi.

11. (Amended) A method of lifting liquids from a well producing hydrocarbons from a formation with a plunger lift having a multipart piston made of a material having a density less than about .25 pounds/cubic inch selected from the group consisting essentially of silicon nitride and titanium alloys having a tensile strength of at least 90,000 psi, comprising

placing a bumper assembly in the well adjacent the formation;
dropping the lower section in the well [at a time when there is substantially no liquid column above the bumper assembly and contacting the bumper assembly];

dropping the upper section in the well and contacting the lower section at the bumper assembly;

uniting the upper and lower [section] sections into a unit near the formation and moving the unit upwardly in the well in response to formation gases passing into the well and thereby pushing liquid upwardly with the piston.